Facility: Fermi 2 Date of Examination: 9/13/2004

Examination Level (circle one): (RO) / SRO Operating Test Number: 2004-401

| Administrative Topic (See Note) | Describe activity to be performed |
|---|---|
| Conduct of Operations | **Verification of Offsite Electrical Lineup**<br>262001 A.C. Electrical Distribution<br>K1. Knowledge of the physical connections and/or cause effect relationships between A.C. ELECTRICAL DISTRIBUTION and the following: (CFR: 41.2 to 41.9 / 45.7 to 45.8)<br>K1.03 Off-site power sources **RO 3.4** / SRO 3.8 |
| Equipment Control | **Verify Valve Configuration – Maintenance on HCU Components**<br>2.1.24 Ability to obtain and interpret station electrical and mechanical drawings. (CFR: 45.12 / 45.13)<br>IMPORTANCE RO 2.8 SRO 3.1<br>2.2.13 Knowledge of tagging and clearance procedures. (CFR: 41.10 / 45.13) **RO 3.6** / SRO 3.8 |
| Radiation Control | **Determine RWP Requirements for Entry into a Locked High Radiation Area**<br>2.3.1 Knowledge of 10 CFR: 20 and related facility radiation control requirements. (CFR: 41.12 / 43.4. 45.9 / 45.10)<br>**RO 2.6** / SRO 3.0 |
| Emergency Plan | **Complete Michigan Notification Form (Site Area)**<br>2.4.15 Knowledge of communications procedures associated with EOP implementation. (CFR: 41.10 / 45.13)<br>**RO 3.0** / SRO 3.5 |

Facility: Fermi 2 Date of Examination: 9/13/2004

Examination Level (circle one): RO / **SRO** Operating Test Number: 2004-401

| Administrative Topic (See Note) | Describe activity to be performed |
|---|---|
| Conduct of Operations | **Verification of Offsite Electrical Lineup**<br>262001 A.C. Electrical Distribution<br>K1. Knowledge of the physical connections and/or cause effect relationships between A.C. ELECTRICAL DISTRIBUTION and the following: (CFR: 41.2 to 41.9 / 45.7 to 45.8)<br>K1.03 Off-site power sources RO 3.4 / **SRO 3.8** |
| Conduct of Operations | **Knowledge of shift staffing requirements**<br>2.1.4 Knowledge of shift staffing requirements.<br>(CFR: 41.10 / 43.2) RO 2.3 / **SRO 3.4** |
| Equipment Control | **Verify Valve Configuration – Maintenance on HCU Components**<br>2.1.24 Ability to obtain and interpret station electrical and mechanical drawings. (CFR: 45.12 / 45.13) RO 2.8 / **SRO 3.1**<br>2.2.13 Knowledge of tagging and clearance procedures.<br>(CFR: 41.10 / 45.13) RO 3.6 / **SRO 3.8** |
| Radiation Control | **Approve a discharge permit**<br>2.3.6 Knowledge of the requirements for reviewing and approving release permits. (CFR: 43.4 / 45.10) RO 2.1 / **SRO 3.1** |
| Emergency Plan | **Determine implementation time for Protective Action Recommendations**<br>2.4.41 Knowledge of the emergency action level thresholds and classifications. (CFR: 43.5 / 45.11) RO 2.3 / **SRO 4.1** |

Facility: Fermi 2 Date of Examination: 9/13/2004

Exam Level (circle one): **RO** / **SRO(I)** / SRO(U) Operating Test No.: 2004-401

**Control Room Systems (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U)**

| System / JPM Title | Type Code* | Safety Function |
|---|---|---|
| **a. Start SBFW (Normal Mode) with Failure of injection valve to open**<br>295031 Reactor Low Water Level - EA1. Ability to operate and/or monitor the following as they apply to REACTOR LOW WATER LEVEL: (CFR: 41.7 / 45.6)<br>EA1.08 Alternate injection systems: Plant-specific **RO 3.8**/ SRO 3.9 | D, A, S | 2 |
| **b. ES-301**<br>209001 Low Pressure Core Spray System - A2. Ability to (a) predict the impacts of the following on the LOW PRESSURE CORE SPRAY SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6)<br>A2.02 Valve closures **RO 3.2**/ SRO 3.2 | D, S, A | 4 |
| **c. Returning a Turbine Control Valve to service**<br>241000 Reactor/Turbine Pressure Regulating System - A4. Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8)<br>A4.08 Control/governor valves (operation) **RO 3.5**/ SRO 3.4 | N, S | 3 |
| **d. Recognize, Respond to Uncontrolled Recirc Pump Speed Increase**<br>A2. Ability to (a) predict the impacts of the following on the RECIRCULATION SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6)<br>A2.05 Inadvertent recirculation flow increase **RO 3.8**/ SRO 4.0 | D, S | 1 |
| **e. Restore Off-Site Power to an ESF and EDG Bus**<br>262001 A.C. Electrical Distribution - A4. Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8)<br>A4.04 Synchronizing and paralleling of different A.C. supplies **RO 3.6**/ SRO 3.7 | D, S | 6 |
| **f. Perform Mode Switch in REFUEL and One Rod Interlock Verification**<br>201002 Reactor Manual Control System - K4. Knowledge of REACTOR MANUAL CONTROL SYSTEM design feature(s) and/or interlocks which provide for the following: (CFR: 41.7)<br>K4.02 Control rod blocks **RO 3.5**/ SRO 3.5 | D, S, L | 7 |
| **g. SGTS Exhaust Damper Failure**<br>261000 Standby Gas Treatment System - A2. Ability to (a) predict the impacts of the following on the STANDBY GAS TREATMENT SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6)<br>A2.01 Low system flow **RO 2.9**/ SRO 3.1 | D, S, A | 9 |
| **h. RWCU blowdown**<br>204000 Reactor Water Cleanup System - A2. Ability to (a) predict the impacts of the following on the REACTOR WATER CLEANUP SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6)<br>A2.12 Excessive drain flow rates **RO 2.7**/ SRO 2.8 | D, S, A | 2 |
| **In-Plant Systems (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)** | | |
| **i. Defeat of RBCCW/EECW to Drywell**<br>295024 High Drywell Pressure - EA1. Ability to operate and/or monitor the following as they apply to HIGH DRYWELL PRESSURE: (CFR: 41.7 / 45.6)<br>EA1.07 PCIS/NSSSS **RO 3.8**/ SRO 3.9 | D, R | 5 |
| **j. Startup a UPS Rectifier Charger/Inverter**<br>262001 A.C. Electrical Distribution - A1. Ability to predict and/or monitor changes in parameters associated with operating the A.C. ELECTRICAL DISTRIBUTION controls including: (CFR: 41.5 / 45.5)<br>A1.05 Breaker lineups **RO 3.2**/ SRO 3.5 | N, R | 6 |
| **k. Take Corrective Action for Main Steam Line Channel A/B/C/D Radiation Monitor Upscale**<br>272000 Radiation Monitoring System - A2. Ability to (d) predict the impacts of the following on the RADIATION MONITORING SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6)<br>A2.16 Instrument malfunctions **RO 2.7**/ SRO 2.9 | D, C, R | 9 |

* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA

Facility: Fermi 2 Date of Examination: 9/13/2004

Exam Level (circle one): **RO /(SRO(I))** SRO(U) Operating Test No.: 2004-401

**Control Room Systems (8 for RO: 7 for SRO-I; 2 or 3 for SRO-U)**

| System / JPM Title | Type Code* | Safety Function |
|---|---|---|
| **a. Start SBFW (Normal Mode) with Failure of injection valve to open**<br>295031 Reactor Low Water Level - EA1. Ability to operate and/or monitor the following as they apply to REACTOR LOW WATER LEVEL: (CFR: 41.7 / 45.6)<br>EA1.08 Alternate injection systems: Plant-specific **RO 3.8**/ SRO 3.9 | D, A, S | 2 |
| **b. Manually Initiate Core Spray System with E21-F005 A(B) Stuck Shut**<br>209001 Low Pressure Core Spray System - A2. Ability to (a) predict the impacts of the following on the LOW PRESSURE CORE SPRAY SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6)<br>A2.02 Valve closures **RO 3.2**/ SRO 3.2 | D, S, A | 4 |
| **c. Returning a Turbine Control Valve to service**<br>241000 Reactor/Turbine Pressure Regulating System - A4. Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8)<br>A4.08 Control/governor valves (operation) **RO 3.5**/ SRO 3.4 | N, S | 3 |
| **d. Recognize, Respond to Uncontrolled Recirc Pump Speed Increase**<br>A2. Ability to (a) predict the impacts of the following on the RECIRCULATION SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6)<br>A2.05 Inadvertent recirculation flow increase **RO 3.8**/ SRO 4.0 | D, S | 1 |
| **e. Perform Mode Switch in REFUEL and One Rod Interlock Verification**<br>201002 Reactor Manual Control System - K4. Knowledge of REACTOR MANUAL CONTROL SYSTEM design feature(s) and/or interlocks which provide for the following: (CFR: 41.7)<br>K4.02 Control rod blocks **RO 3.5**/ SRO 3.5 | D, S, L | 7 |
| **f. SGTS Exhaust Damper Failure**<br>261000 Standby Gas Treatment System - A2. Ability to (a) predict the impacts of the following on the STANDBY GAS TREATMENT SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6)<br>A2.01 Low system flow **RO 2.9**/ SRO 3.1 | D, S, A | 9 |
| **g. RWCU blowdown**<br>204000 Reactor Water Cleanup System - A2. Ability to (a) predict the impacts of the following on the REACTOR WATER CLEANUP SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6)<br>A2.12 Excessive drain flow rates **RO 2.7**/ SRO 2.8 | D, S, A | 2 |
| **In-Plant Systems (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)** | | |
| **h. Defeat of RBCCW/EECW to Drywell**<br>295024 High Drywell Pressure - EA1. Ability to operate and/or monitor the following as they apply to HIGH DRYWELL PRESSURE: (CFR: 41.7 / 45.6)<br>EA1.07 PCIS/NSSSS **RO 3.8**/ SRO 3.9 | D, R | 5 |
| **i. Startup a UPS Rectifier Charger/Inverter**<br>262001 A.C. Electrical Distribution - A1. Ability to predict and/or monitor changes in parameters associated with operating the A.C. ELECTRICAL DISTRIBUTION controls including: (CFR: 41.5 / 45.5)<br>A1.05 Breaker lineups **RO 3.2**/ SRO 3.5 | N, R | 6 |
| **j. Take Corrective Action for Main Steam Line Channel A/B/C/D Radiation Monitor Upscale**<br>272000 Radiation Monitoring System - A2. Ability to (d) predict the impacts of the following on the RADIATION MONITORING SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6)<br>A2.16 Instrument malfunctions **RO 2.7**/ SRO 2.9 | D, C, R | 9 |

* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA

Facility: Fermi 2 Date of Examination: 9/13/2004

Exam Level (circle one): RO / SRO(I) / **SRO(U)** Operating Test No.: 2004-401

**Control Room Systems (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U)**

| System / JPM Title | Type Code* | Safety Function |
|---|---|---|
| **a. Start SBFW (Normal Mode) with Failure of injection valve to open**<br>295031 Reactor Low Water Level - EA1. Ability to operate and/or monitor the following as they apply to REACTOR LOW WATER LEVEL: (CFR: 41.7 / 45.6)<br>EA1.08 Alternate injection systems: Plant-specific RO 3.8/ **SRO 3.9** | D, S, A | 2 |
| **b. Returning a Turbine Control Valve to service**<br>241000 Reactor/Turbine Pressure Regulating System - A4. Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8)<br>A4.08 Control/governor valves (operation) RO 3.5/ **SRO 3.4** | N, S | 3 |
| **c. SGTS Exhaust Damper Failure**<br>261000 Standby Gas Treatment System – A2. Ability to (a) predict the impacts of the following on<br>the STANDBY GAS TREATMENT SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6)<br>A2.01 Low system flow RO 2.9/ **SRO 3.1** | D, S, A | 9 |
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**In-Plant Systems (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)**

| | | |
|---|---|---|
| **d. Defeat of RBCCW/EECW to Drywell**<br>295024 High Drywell Pressure - EA1. Ability to operate and/or monitor the following as they apply to HIGH DRYWELL PRESSURE: (CFR: 41.7 / 45.6)<br>EA1.07 PCIS/NSSSS RO 3.8/ **SRO 3.9** | D, R | 5 |
| **e. Startup a UPS Rectifier Charger/Inverter**<br>262001 A.C. Electrical Distribution - A1. Ability to predict and/or monitor changes in parameters associated with operating the A.C. ELECTRICAL DISTRIBUTION controls including: (CFR: 41.5 / 45.5)<br>A1.05 Breaker lineups RO 3.2/ **SRO 3.5** | N, R | 6 |
| | | |

* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA

Facility: Fermi 2 Date of Examination: 9/13/2004

Exam Level (circle one): **RO / SRO(I)** SRO(U) Operating Test No.: 2004-401

**Control Room Systems (8 for RO: & for SRO-I; 2 or 3 for SRO-U)**

| System / JPM Title | Type Code* | Safety Function |
|---|---|---|
| **a. Start SBFW (Normal Mode) with Failure of injection valve to open**<br>295031 Reactor Low Water Level - EA1. Ability to operate and/or monitor the following as they apply to REACTOR LOW WATER LEVEL: (CFR: 41.7 / 45.6)<br>EA1.08 Alternate injection systems: Plant-specific **RO 3.8**/ SRO 3.9 | D, A, S | 2 |
| **b. ES-301**<br>209001 Low Pressure Core Spray System - A2. Ability to (a) predict the impacts of the following on the LOW PRESSURE CORE SPRAY SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6)<br>A2.02 Valve closures **RO 3.2**/ SRO 3.2 | D, S, A | 4 |
| **c. Returning a Turbine Control Valve to service**<br>241000 Reactor/Turbine Pressure Regulating System - A4. Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8)<br>A4.08 Control/governor valves (operation) **RO 3.5**/ SRO 3.4 | N, S | 3 |
| **d. Recognize, Respond to Uncontrolled Recirc Pump Speed Increase**<br>A2. Ability to (a) predict the impacts of the following on the RECIRCULATION SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6)<br>A2.05 Inadvertent recirculation flow increase **RO 3.8**/ SRO 4.0 | D, S | 1 |
| **e. ES-301**<br>262001 A.C. Electrical Distribution - A4. Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8)<br>A4.04 Synchronizing and paralleling of different A.C. supplies **RO 3.6**/ SRO 3.7 | D, S | 6 |
| **f. ES-301**<br>201002 Reactor Manual Control System - K4. Knowledge of REACTOR MANUAL CONTROL SYSTEM design feature(s) and/or interlocks which provide for the following: (CFR: 41.7)<br>K4.02 Control rod blocks **RO 3.5**/ SRO 3.5 | D, S, L | 7 |
| **g. SGTS Exhaust Damper Failure**<br>261000 Standby Gas Treatment System - A2. Ability to (a) predict the impacts of the following on the STANDBY GAS TREATMENT SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6)<br>A2.01 Low system flow **RO 2.9**/ SRO 3.1 | D, S, A | 9 |
| **h. ES-301**<br>204000 Reactor Water Cleanup System - A2. Ability to (a) predict the impacts of the following on the REACTOR WATER CLEANUP SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6)<br>A2.12 Excessive drain flow rates **RO 2.7**/ SRO 2.8 | D, S, A | 2 |
| **In-Plant Systems (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)** | | |
| **i. Defeat of RBCCW/EECW to Drywell**<br>295024 High Drywell Pressure - EA1. Ability to operate and/or monitor the following as they apply to HIGH DRYWELL PRESSURE: (CFR: 41.7 / 45.6)<br>EA1.07 PCIS/NSSSS **RO 3.8**/ SRO 3.9 | D, R | 5 |
| **j. Startup a UPS Rectifier Charger/Inverter**<br>262001 A.C. Electrical Distribution - A1. Ability to predict and/or monitor changes in parameters associated with operating the A.C. ELECTRICAL DISTRIBUTION controls including: (CFR: 41.5 / 45.5)<br>A1.05 Breaker lineups **RO 3.2**/ SRO 3.5 | N, R | 6 |
| **k. ES-301**<br>272000 Radiation Monitoring System - A2. Ability to (d) predict the impacts of the following on the RADIATION MONITORING SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6)<br>A2.16 Instrument malfunctions **RO 2.7**/ SRO 2.9 | D, C, R | 9 |

* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA

Facility: Fermi 2 Date of Examination: 9/13/2004

Exam Level (circle one): RO / SRO(I) / **SRO(U)** Operating Test No.: 2004-401

**Control Room Systems (8 for RO: & for SRO-I; 2 or 3 for SRO-U)**

| System / JPM Title | Type Code* | Safety Function |
|---|---|---|
| **a. Start SBFW (Normal Mode) with Failure of injection valve to open**<br>295031 Reactor Low Water Level - EA1. Ability to operate and/or monitor the following as they apply to REACTOR LOW WATER LEVEL: (CFR: 41.7 / 45.6)<br>EA1.08 Alternate injection systems: Plant-specific RO 3.8/ **SRO 3.9** | D, S, A | 2 |
| **b. Returning a Turbine Control Valve to service**<br>241000 Reactor/Turbine Pressure Regulating System - A4. Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8)<br>A4.08 Control/governor valves (operation) RO 3.5/ **SRO 3.4** | N, S | 3 |
| **c. SGTS Exhaust Damper Failure**<br>261000 Standby Gas Treatment System – A2. Ability to (a) predict the impacts of the following on<br>the STANDBY GAS TREATMENT SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6)<br>A2.01 Low system flow RO 2.9/ **SRO 3.1** | D, S, A | 9 |
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**In-Plant Systems (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)**

| | | |
|---|---|---|
| **d. Defeat of RBCCW/EECW to Drywell**<br>295024 High Drywell Pressure - EA1. Ability to operate and/or monitor the following as they apply to HIGH DRYWELL PRESSURE: (CFR: 41.7 / 45.6)<br>EA1.07 PCIS/NSSSS RO 3.8/ **SRO 3.9** | D, R | 5 |
| **e. Startup a UPS Rectifier Charger/Inverter**<br>262001 A.C. Electrical Distribution - A1. Ability to predict and/or monitor changes in parameters associated with operating the A.C. ELECTRICAL DISTRIBUTION controls including: (CFR: 41.5 / 45.5)<br>A1.05 Breaker lineups RO 3.2/ **SRO 3.5** | N, R | 6 |
| | | |

* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA

Facility: Fermi 2 Scenario No. 1 Op-Test No: 2004-401

Examiners: _____ Operators: _____

**Initial Conditions:** IC-18, EOL, 100% Rx. Power.

**Turnover:** The plant has been operating for 364 days. Reactor Power is currently 100% of rated thermal power. All rods are full out. CRD Pump "B" is out of service due to high vibration on the motor bearings. It will be returned to service in two days. This shift will place RHR in Torus Cooling in preparation of the next shift conducting a surveillance for HPCI Testing.

**NOTE:** The Pre-job Briefing for placing RHR in Torus Cooling is to be conducted by the crew prior to entering the simulator. (suggested time 30 minutes prior to beginning the scenario).

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | N/A | N (BOP) | Place RHR in Torus Cooling |
| 2 | MF 1423 | C (BOP) | RHRSW Pump "B" Trip |
| 3 | VO1402 | I (BOP) | Hotwell Level Controller Primary Instrument Fails high |
| 4 | MF 3652 | C (BOP) | Trip of "South" Reactor Feedpump |
| 5 | MF 1638 | I (RO) | Recirc Flow Limiter "A" Logic Failure |
| 6 | N/A | R (RO) | Insert CRAM Array |
| 7 | MR 3571 | M (All) | Leak in Torus<br>(Value = 100%, ramped over 600 sec.) |
| 8 | MF 3595 | C (RO) | RPS Fails to Cause a Scram |
| 8 | N/A | | Emergency Depressurization is required |
| 9 | MF 1435 | | High Pressure Coolant Injection (HPCI ) trip |
| 10 | MF 0020<br>MF 0023 | C (BOP) | SRV "E" Fails to open<br>SRV "H" Fails to open |
| 11 | MF 3385<br>MF 3387 | | "E" Bypass Valve Fails Closed<br>"W" Bypass Valve Fails Closed |

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Facility: Fermi 2 Scenario No. 2 Op-Test No: 2004-401

Examiners: _____ Operators: _____

**Initial Conditions: :** IC-17, MOL, 100% Rx. Power

**Turnover:** The plant is operating steady state at approximately 100% of rated thermal power. The south TBCCW pump is out of service for motor replacement. Activities for the upcoming shift are to reduce power to approximately 88% to allow for Turbine Valve Testing using Reactor Recirculation Flow.

**NOTE:** The Pre-job Briefing on power reduction per GOP 22.000.03 is to be conducted by the crew prior to entering the simulator. (suggested time 30 minutes prior to beginning the scenario).

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | N/A | N (RO)<br>N (SRO) | Power reduction using Recirculation Flow |
| 2 | MF 1431 | I (BOP) | HPCI Inadvertent Initiation |
| 3 | VO 0063 | C (RO) | RR "A" Flow Controller Fails High<br>(Insert manually, stepping it up slowly until the scoop tube is locked. **DO NOT USE ARROWS**)<br>Also ensure RF for scoop tube lock is inserted using the Cetran Window. |
| 4 | MF 0043 | M (ALL) | Main Steam Leak in Steam Tunnel outside Primary Containment,<br>(Value=2%/600 sec.) |
| 5 | RF 0014<br>RF 0025 | C (BOP) | MSIVs failure to automatically close |
| 6 | MF 3671 | M (RO) | ATWS (Value=5% Rod Density) |
| 7 | PO 00263<br>MF 1791 | I (RO) | SLC Tank Level Transmitter Failure |

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Facility: Fermi 2 Scenario No. 3 (spare) Op-Test No: 2004-401

Examiners: _____ Operators: _____

**Initial Conditions:** IC-07, BOL, Rx. Press. 350 Psig

**Turnover:** The plant is in the process of a startup in accordance with 22.000.02. IRM Range on range 6, Rod sequence A002, RWM Step 20, Rod 18-27 at position 00-04, page 24 of 56 of the Rod Pull Sheets. The crew is to continue the startup and synchronize the generator to the grid. EDG 13 is Out of Service for a relay repair that was discovered after startup commenced. Repairs and testing will be complete prior to entering Mode 1.

**NOTE:** The Pre-job Briefing for placing Generator Synchronization is to be conducted by the crew prior to entering the simulator. (suggested time 30 minutes prior to beginning the scenario).

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | N/A | R (RO) | Increase reactor power using control rods |
| 2 | MF 1200 | I (RO) | IRM "D" Failure Upscale (value = 130) |
| 3 | MF 0059 | C (RO) | CRD FCV F002A fails closed |
| 4 | MF 3652 | I (All) | Fuel Pool Radiation Monitor Fails |
| 5 | RF 1424<br>RF 1425<br>RF1376 | C / M (RO) | Loss of Offsite Power |
| 6 | MF 0005 | C / M (All) | Steam Leak in Drywell (HPCI Stm line)<br>(Value: 5%, ramped over 120 sec., 5 Min. T.D. after LOOP) |
| 7 | MF 3550 | M (All) | EDG 12 Trips after starting |
| 8 | MF 1418 | C (RO) | RHR Pump "A" Fails to start |

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Facility: **Fermi 2** Date of Exam: **09/13/04**

| Tier | Group | RO K/A Category Points | | | | | | | | | | | SRO-Only Points | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G * | Total | K | A | A 2 | G * | Total |
| 1. Emergency & Abnormal Plant Evolutions | 1 | 3 | 4 | 3 | | | | 4 | 4 | | | 2 | 20 | N/A | N/A | N/A | N/A | N/A |
| | 2 | 0 | 2 | 2 | | | | 2 | 1 | | | 0 | 7 | N/A | N/A | N/A | N/A | N/A |
| | Tier Totals | 3 | 6 | 5 | | | | 6 | 5 | | | 2 | 27 | N/A | N/A | N/A | N/A | N/A |
| 2. Plant Systems | 1 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 26 | N/A | N/A | N/A | N/A | N/A |
| | 2 | 2 | 0 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 0 | 12 | N/A | N/A | N/A | N/A | N/A |
| | Tier Totals | 5 | 2 | 4 | 5 | 4 | 3 | 3 | 3 | 4 | 3 | 2 | 38 | N/A | N/A | N/A | N/A | N/A |
| 3. Generic Knowledge and Abilities Categories | | | | | 1 | | 2 | | 3 | | 4 | | 10 | 1 | 2 | 3 | 4 | N/A |
| | | | | | 3 | | 2 | | 2 | | 3 | | | N/A | N/A | N/A | N/A | |

Note:
1. Ensure that at least two topics from every K/A category are sampled within each tier of the RO Outline(i.e., the "Tier Totals" in each K/A category shall not be less than two). Refer to Section D.1.c for additional guidance regarding SRO sampling.
2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ±1 from that specified in the table based on NRC revisions. The final exam must total 75 points and the SRO-only exam must total 25 points.
3. Select topics from many systems and evolutions; avoid selecting more than two K/A topics from a given system or evolution unless they relate to plant-specific priorities.
4. Systems/evolutions within each group are identified on the associated outline.
5. The shaded areas are not applicable to the category/tier.
6.* The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system. The SRO K/As must also be linked to 10CFR 55.43 or an SRO-level Learning objective.
7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IR) for the applicable license level, and the point totals for each system and category. Enter the group and tier totals for each category in the table above; summarize all the SRO-only knowledge and non-A2 ability categories in the columns labeled "K" and "A." Use duplicate pages for RO and SRO-only exams.
8. For Tier 3, enter the K/A numbers, descriptions, importance ratings, and point totals on Form ES-401-3.
9. Refer to ES-401, Attachment 2 for guidance regarding the elimination of inappropriate K/A statements.

| ES-401 | BWR Examination Outline<br>Emergency and Abnormal Plant Evolutions – Tier 1/Group 1 (**RO**) | | | | | | | Form ES-401-1 | |
|---|---|---|---|---|---|---|---|---|---|
| E/APE # / Name / Safety Function | K 1 | K 2 | K 3 | A 1 | A 2 | G | K/A Topic | IR | # |
| 295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4 **(#1)** | | | | | 6 | | Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION : (CFR: 41.10 / 43.5 / 45.13)<br>Nuclear boiler instrumentation | 3.2 | 1 |
| 295003 Partial or Complete Loss of AC / 6 **(#2)** | | 2 | | | | | Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF A.C. POWER and the following: (CFR: 41.7 / 45.8)<br>Emergency generators | 4.1 | 2 |
| 295004 Partial or Total Loss of DC Pwr / 6 **(#3)** | | 1 | | | | | Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF D.C. POWER and the following: (CFR: 41.7 / 45.8)<br>Battery charger | 3.1 | 3 |
| 295005 Main Turbine Generator Trip / 3 **(#4)** | | | 4 | | | | Knowledge of the reasons for the following responses as they apply to MAIN TURBINE GENERATOR TRIP: (CFR: 41.5 / 45.6)<br>Main generator trip | 3.2 | 4 |
| 295006 SCRAM / 1 **(#5)** | | | | 4 | | | Ability to operate and/or monitor the following as they apply to SCRAM :(CFR: 41.7 / 45.6)<br>Recirculation system | 3.1 | 5 |
| 295016 Control Room Abandonment / 7 **(#6)** | | | 2 | | | | Knowledge of the reasons for the following responses as they apply to CONTROL ROOM ABANDONMENT : (CFR: 41.5 / 45.6)<br>Turbine trip | 3.7 | 6 |
| 295018 Partial or Total Loss of CCW / 8 **(#7)** | 1 | | | | | | Knowledge of the operational implications of the following concepts as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER : (CFR: 41.8 to 41.10)<br>Effects on component/system operations | 3.5 | 7 |
| 295019 Partial or Total Loss of Inst. Air / 8 **(#8)** | | | | | | * | 2.1.27 Knowledge of system purpose and or function. | 2.8 | 8 |
| 295021 Loss of Shutdown Cooling / 4 **(#9)** | | | | 1 | | | Ability to operate and/or monitor the following as they apply to LOSS OF SHUTDOWN COOLING : (CFR: 41.7 / 45.6)<br>Reactor water cleanup system | 3.4 | 9 |
| 295023 Refueling Acc Cooling Mode / 8 **(#10)** | | | | | 5 | | Ability to determine and/or interpret the following as they apply to REFUELING ACCIDENTS : (CFR: 41.10 / 43.5 / 45.13)<br>Entry conditions of emergency plan | 3.2 | 10 |
| 295024 High Drywell Pressure / 5 **(#11)** | 1 | | | | | | Knowledge of the operational implications of the following concepts as they apply to HIGH DRYWELL PRESSURE : (CFR: 41.8 to 41.10)<br>Drywell integrity: | 4.1 | 11 |
| 295025 High Reactor Pressure / 3 **(#12)** | | | | 3 | | | Ability to operate and/or monitor the following as they apply to HIGH REACTOR PRESSURE: (CFR: 41.7 / 45.6)<br>Safety/relief valves: | 4.4 | 12 |

| ES-401 | BWR Examination Outline<br>Emergency and Abnormal Plant Evolutions – Tier 1/Group 1 (**RO**) | | | | | | | Form ES-401-1 | |
|---|---|---|---|---|---|---|---|---|---|
| E/APE # / Name / Safety Function | K 1 | K 2 | K 3 | A 1 | A 2 | G | K/A Topic | IR | # |
| **(#13)** | | | | | 2 | | Ability to determine and/or interpret the following as they apply to HIGH REACTOR PRESSURE: (CFR: 41.10 / 43.5 / 45.13)<br>Reactor power | 4.2 | 13 |
| 295026 Suppression Pool High Water Temp. / 5 **(#14)** | | | | | | * | 2.4.18 Knowledge of the specific bases for EOPs. (CFR: 41.10 / 45.13) | 2.7 | 14 |
| 295028 High Drywell Temperature / 5 **(#15)** | 1 | | | | | | Knowledge of the operational implications of the following concepts as they apply to HIGH DRYWELL TEMPERATURE : (CFR: 41.8 to 41.10)<br>Reactor water level measurement | 3.5 | 15 |
| 295030 Low Suppression Pool Wtr Lvl / 5 **(#16)** | | | | | 1 | | Ability to determine and/or interpret the following as they apply to LOW SUPPRESSION POOL WATER LEVEL : (CFR: 41.10 / 43.5 / 45.13)<br>Suppression pool level | 4.1 | 16 |
| 295031 Reactor Low Water Level / 2 **(#17)** | | 8 | | | | | Knowledge of the interrelations between REACTOR LOW WATER LEVEL and the following: (CFR: 41.7 / 45.8)<br>Automatic depressurization system | 4.2 | 17 |
| 295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1 **(#18)** | | 4 | | | | | Knowledge of the interrelations between SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN and the following: (CFR: 41.7 / 45.8)<br>SBLC system | 4.4 | 18 |
| 295038 High Off-site Release Rate / 9 **(#19)** | | | 1 | | | | Knowledge of the reasons for the following responses as they apply to HIGH OFF-SITE RELEASE RATE: (CFR: 41.5 / 45.6)<br>Implementation of site emergency plan | 3.6 | 19 |
| 600000 Plant Fire On Site / 8 **(#20)** | | | | 5 | | | Ability to operate and / or monitor the following as they apply to PLANT FIRE ON SITE:<br>Plant and control room ventilation systems | 3.0 | 20 |
| K/A Category Totals: | 3 | 4 | 3 | 4 | 4 | 2 | Group Point Total: | | 20 |

| ES-401 | BWR Examination Outline | | | | | | | Form ES-401-1 | |
|---|---|---|---|---|---|---|---|---|---|
| Emergency and Abnormal Plant Evolutions – Tier 1/Group 2 (**RO**) | | | | | | | | | |
| E/APE # / Name / Safety Function | K 1 | K 2 | K 3 | A 1 | A 2 | G | K/A Topic | IR | # |
| 295002 Loss of Main Condenser Vac / 3 | | | | | | | Not randomly selected | | |
| 295007 High Reactor Pressure / 3 **(#21)** | | 6 | | | | | Knowledge of the interrelations between HIGH REACTOR PRESSURE and the following: (CFR: 41.7 / 45.8) PCIS/NSSSS: | 3.5 | 21 |
| 295008 High Reactor Water Level / 2 **(#22)** | | | | 4 | | | Ability to operate and/or monitor the following as they apply to HIGH REACTOR WATER LEVEL : (CFR: 41.7 / 45.6) HPCI | 3.5 | 22 |
| 295009 Low Reactor Water Level / 2 **(#23)** | | 1 | | | | | Knowledge of the interrelations between LOW REACTOR WATER LEVEL and the following: (CFR: 41.7 / 45.8) Reactor water level indication | 3.9 | 23 |
| 295010 High Drywell Pressure / 5 | | | | | | | Not randomly selected | | |
| 295011 High Containment Temperature / 5 | | | | | | | Not randomly selected | | |
| 295012 High Drywell Temperature / 5 | | | | | | | Not randomly selected | | |
| 295013 High Suppression Pool Temp. / 5 **(#24)** | | | | | 1 | | Ability to determine and/or interpret the following as they apply to HIGH SUPPRESSION POOL TEMPERATURE : (CFR: 41.10 / 43.5 / 45.13) Suppression pool temperature | 3.8 | 24 |
| 295014 Inadvertent Reactivity Addition / 1 | | | | | | | Not randomly selected | | |
| 295015 Incomplete SCRAM / 1 | | | | | | | Not randomly selected | | |
| 295017 High Off-site Release Rate / 9 **(#25)** | | | 2 | | | | Knowledge of the reasons for the following responses as they apply to HIGH OFF-SITE RELEASE RATE : (CFR: 41.5 / 45.6) Plant ventilation | 3.3 | 25 |
| 295020 Inadvertent Cont. Isolation / 5 & 7 | | | | | | | Not randomly selected | | |
| 295022 Loss of CRD Pumps / 1 | | | | | | | Not randomly selected | | |
| 295029 High Suppression Pool Wtr Lvl / 5 | | | | | | | Not randomly selected | | |
| 295032 High Secondary Containment Area Temperature / 5 | | | | | | | Not randomly selected | | |
| 295033 High Secondary Containment Area Radiation Levels / 9 **(#26)** | | | | 8 | | | Ability to operate and/or monitor the following as they apply to HIGH SECONDARY CONTAINMENT AREA RADIATION LEVELS : (CFR: 41.7 / 45.6) Control room ventilation: | 3.6 | 26 |
| 295034 Secondary Containment Ventilation High Radiation / 9 | | | | | | | Not randomly selected | | |
| 295035 Secondary Containment High Differential Pressure / 5 | | | | | | | Not randomly selected | | |
| 295036 Secondary Containment High Sump/Area Water Level / 5 | | | | | | | Not randomly selected | | |
| 500000 High CNTMT Hydrogen Conc. / 5 **(#27)** | | | 4 | | | | Knowledge of the reasons for the following responses as they apply to HIGH PRIMARY CONTAINMENT HYDROGEN CONCENTRATIONS: (CFR: 41.5 / 45.6) Emergency depressurization | 3.1 | 27 |
| K/A Category Totals: | 0 | 2 | 2 | 2 | 1 | 0 | Group Point Total: | | 7 |

| ES-401 | BWR Examination Outline<br>Emergency and Abnormal Plant Evolutions – Tier 2/Group 1 (**RO**) | | | | | | | | | | | Form ES-401-1 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E/APE # / Name / Safety Function | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G | K/A Topic | IR | # |
| 203000 RHR/LPCI: Injection Mode<br>**(#28)** | | | | | | | 1 | | | | | Ability to predict and/or monitor changes in parameters associated with operating the RHR/LPCI: INJECTION MODE (PLANT SPECIFIC) controls including: (CFR: 41.5 / 45.5)<br>Reactor water level | 4.2 | 28 |
| 205000 Shutdown Cooling<br>**(#29)** | | | | | 3 | | | | | | | Knowledge of the operational implications of the following concepts as they apply to SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE) : (CFR: 41.5 / 45.3)<br>Heat removal mechanisms | 2.8 | 29 |
| 206000 HPC<br>**(#30)** | | | 1 | | | | | | | | | Knowledge of the effect that a loss or malfunction of the HIGH PRESSURE COOLANT INJECTION SYSTEM will have on following: (CFR: 41.7 / 45.4)<br>Reactor water level control: | 4.0 | 30 |
| **(#31)** | | | | | | | | | 5 | | | Ability to monitor automatic operations of the HIGH PRESSURE COOLANT INJECTION SYSTEM including: (CFR: 41.7 / 45.7)<br>Reactor water level: | 4.3 | 31 |
| 209001 LPCS<br>**(#32)** | | | | | | | | 1 | | | | Ability to (a) predict the impacts of the following on the LOW PRESSURE CORE SPRAY SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6)<br>Pump trips01+ | 3.4 | 32 |
| 211000 SLC<br>**(#33)** | | | | | | | | | | 8 | | Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8)<br>System initiation: | 4.2 | 33 |
| 212000 RPS<br>**(#34)** | 13 | | | | | | | | | | | Knowledge of the physical connections and/or cause effect relationships between REACTOR PROTECTION SYSTEM and the following: (CFR: 41.2 to 41.9 / 45.7 to 45.8)<br>Containment pressure | 3.5 | 34 |
| **(#35)** | | | | 9 | | | | | | | | Knowledge of REACTOR PROTECTION SYSTEM design feature(s) and/or interlocks which provide for the following: (CFR: 41.7)<br>Control rod insertion following RPS system electrical failure | 3.8 | 35 |
| 215003 IRM<br>**(#36)** | | | | | | | | | | | * | **2.2.2** Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels. (CFR: 45.2) | 4.0 | 36 |
| 215004 Source Range Monitor<br>**(#37)** | | | | | | 2 | | | | | | Knowledge of the effect that a loss or malfunction of the following will have on the SOURCE RANGE MONITOR (SRH) SYSTEM : (CFR: 41.7 / 45.7)<br>24/48 volt D.C. power | 3.1 | 37 |
| 215005 APRM / LPRM<br>**(#38)** | | 2 | | | | | | | | | | Knowledge of electrical power supplies to the following: (CFR: 41.7)<br>APRM channels | 2.6 | 38 |

| ES-401 | BWR Examination Outline<br>Emergency and Abnormal Plant Evolutions – Tier 2/Group 1 (**RO**) | | | | | | | | | | | Form ES-401-1 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E/APE # / Name / Safety Function | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G | K/A Topic | IR | # |
| 217000 RCIC<br>**(#39)** | | | | | | | | 10 | | | | Ability to (a) predict the impacts of the following on the REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6)<br>Turbine control system failures | 3.1 | 39 |
| 218000 ADS<br>**(#40)** | | | | | 1 | | | | | | | Knowledge of the operational implications of the following concepts as they apply to AUTOMATIC DEPRESSURIZATION SYSTEM : (CFR: 41.5 / 45.3)<br>ADS logic operation | 3.8 | 40 |
| 223002 PCIS/Nuclear Steam Supply Shutoff<br>**(#41)** | | | | | | | 2 | | | | | Ability to predict and/or monitor changes in parameters associated with operating the PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF controls including: (CFR: 41.5 / 45.5)<br>Valve closures | 3.7 | 41 |
| 239002 SRVs<br>**(#42)** | | | | 4 | | | | | | | | Knowledge of RELIEF/SAFETY VALVES design feature(s) and/or interlocks which provide for the following: (CFR: 41.7)<br>Ensures even distribution of heat load to suppression pool, and adequate steam condensing | 3.4 | 42 |
| 259002 Reactor Water Level Control<br>**(#43)** | 6 | | | | | | | | | | | Knowledge of the physical connections and/or cause effect relationships between REACTOR WATER LEVEL CONTROL SYSTEM and the following: (CFR: 41.2 to 41.9 / 45.7 to 45.8)<br>Plant air systems | 3.0 | 43 |
| **(#44)** | | | | | | | | | 4 | | | Ability to monitor automatic operations of the REACTOR WATER LEVEL CONTROL SYSTEM including: (CFR: 41.7 / 45.7)<br>Changes in reactor feedwater flow | 3.2 | 44 |
| 261000 SGTS<br>**(#45)** | | | 2 | | | | | | | | | Knowledge of the effect that a loss or malfunction of the STANDBY GAS TREATMENT SYSTEM will have on following: (CFR: 41.7 /45.6)<br>Off-site release rate | 3.6 | 45 |
| 262001 AC Electrical Distribution<br>**(#46)** | | | 4 | | | | | | | | | Knowledge of the effect that a loss or malfunction of the A.C. ELECTRICAL DISTRIBUTION will have on following: (CFR: 41.7 / 45.4)<br>Uninterruptible power supply | 3.1 | 46 |
| **(#47)** | | | | | | | | | | | * | 2.4.11 Knowledge of abnormal condition procedures. (CFR: 41.10 / 43.5 / 45.13) | 3.4 | 47 |
| 262002 UPS (AC/DC)<br>**(#48)** | 5 | | | | | | | | | | | Knowledge of the physical connections and/or cause effect relationships between UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.) and the following:<br>(CFR: 41.2 to 41.9 / 45.7 to 45.8)<br>Reactor/turbine pressure control system control unit: | 2.7 | 48 |

| ES-401 | BWR Examination Outline<br>Emergency and Abnormal Plant Evolutions – Tier 2/Group 1 (**RO**) | | | | | | | | | | | | Form ES-401-1 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E/APE # / Name / Safety Function | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G | K/A Topic | IR | # |
| 263000 DC Electrical Distribution **(#49)** | | | | 1 | | | | | | | | Knowledge of D.C. ELECTRICAL DISTRIBUTION design feature(s) and/or interlocks which provide for the following: (CFR: 41.7)<br>Manual/ automatic transfers of control: | 3.1 | 49 |
| 264000 EDGs **(#50)** | | | | | | | | | 5 | | | Ability to monitor automatic operations of the EMERGENCY GENERATORS (DIESEL/JET) including: (CFR: 41.7 / 45.7)<br>Load shedding and sequencing | 3.4 | 50 |
| 300000 Instrument Air **(#51)** | | 1 | | | | | | | | | | Knowledge of electrical power supplies to the following: (CFR: 41.7)<br>Instrument air compressor | 2.8 | 51 |
| **(#52)** | | | | | | 7 | | | | | | Knowledge of the effect that a loss or malfunction of the following will have on the INSTRUMENT AIR SYSTEM: (CFR: 41.7 / 45.7)<br>Valves | 2.5 | 52 |
| 400000 Component Cooling Water **(#53)** | | | | | | | | | | 1 | | Ability to manually operate and / or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8)<br>CCW indications and control | 3.1 | 53 |
| K/A Category Totals: | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | Group Point Total: | | 26 |

| ES-401 | BWR Examination Outline<br>Emergency and Abnormal Plant Evolutions – Tier 2/Group 2 (**RO**) | | | | | | | | | | | Form ES-401-1 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E/APE # / Name / Safety Function | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G | K/A Topic | IR | # |
| 201001 CRD Hydraulic<br>**(#54)** | | | | | | | | 1 | | | | Ability to (a) predict the impacts of the following on the CONTROL ROD DRIVE HYDRAULIC SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6)<br>Pumps trips | 3.2 | 54 |
| 201002 RMCS | | | | | | | | | | | | Not randomly selected | | |
| 201003 Control Rod and Drive Mechanism<br>**(#55)** | | | | | | | | | | 2 | | Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8)<br>CRD mechanism position: | 3.5 | 55 |
| 201006 RWM | | | | | | | | | | | | Not randomly selected | | |
| 202001 Recirculation<br>**(#56)** | 12 | | | | | | | | | | | Knowledge of the physical connections and/or cause effect relationships between RECIRCULATION SYSTEM and the following: (CFR: 41.2 to 41.9 / 45.7 to 45.8)<br>Recirculation system motor-generator sets: | 3.6 | 56 |
| 202002 Recirculation Flow Control | | | | | | | | | | | | Not randomly selected | | |
| 204000 RWCU | | | | | | | | | | | | Not randomly selected | | |
| 214000 RPIS<br>**(#57)** | | | | 1 | | | | | | | | Knowledge of ROD POSITION INFORMATION SYSTEM design feature(s) and/or interlocks which provide for the following: (CFR: 41.7)<br>Reed switch locations | 3.0 | 57 |
| 215001 Traversing In-core Probe | | | | | | | | | | | | Not randomly selected | | |
| 215002 RBM | | | | | | | | | | | | Not randomly selected | | |
| 216000 Nuclear Boiler Inst. | | | | | | | | | | | | Not randomly selected | | |
| 219000 RHR/LPCI: Torus/Pool Cooling Mode<br>**(#58)** | | | | | | | 2 | | | | | Ability to predict and/or monitor changes in parameters associated with operating the RHR/LPCI: TORUS/SUPPRESSION POOL COOLING MODE controls including: (CFR: 41.5 / 45.5)<br>System flow | 3.5 | 58 |
| 223001 Primary CTMT and Aux. | | | | | | | | | | | | Not randomly selected | | |
| 226001 RHR/LPCI: CTMT Spray Mode<br>**(#59)** | | | | | 6 | | | | | | | Knowledge of the operational implications of the following concepts as they apply to RHR/LPCI: CONTAINMENT SPRAY SYSTEM MODE :(CFR: 41.5 / 45.3)<br>Vacuum breaker operation | 2.6 | 59 |
| 230000 RHR/LPCI: Torus/Pool Spray Mode | | | | | | | | | | | | Not randomly selected | | |
| 233000 Fuel Pool Cooling and Cleanup | | | | | | | | | | | | Not randomly selected | | |
| 234000 Fuel Handling Equipment | | | | | | | | | | | | Not randomly selected | | |

| ES-401 | BWR Examination Outline<br>Emergency and Abnormal Plant Evolutions – Tier 2/Group 2 (**RO**) | | | | | | | | | | | Form ES-401-1 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E/APE # / Name / Safety Function | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G | K/A Topic | IR | # |
| 239001 Main and Reheat Steam **(#60)** | 5 | | | | | | | | | | | Knowledge of the physical connections and/or cause effect relationships between MAIN AND REHEAT STEAM SYSTEM and the following: (CFR: 41.2 to 41.9 / 45.7 to 45.8)<br>Moisture separator reheaters: | 2.8 | 60 |
| 239003 MSIV Leakage Control | | | | | | | | | | | | Not randomly selected | | |
| 241000 Reactor/Turbine Pressure Regulator | | | | | | | | | | | | Not randomly selected | | |
| 245000 Main Turbine Gen. and Auxiliaries | | | | | | | | | | | | Not randomly selected | | |
| 256000 Reactor Condensate | | | | | | | | | | | | Not randomly selected | | |
| 259001 Reactor Feedwater **(#61)** | | | 1 | | | | | | | | | Knowledge of the effect that a loss or malfunction of the REACTOR FEEDWATER SYSTEM will have on following: (CFR: 41.7 / 45.4)<br>Reactor water level | 3.9 | 61 |
| 268000 Radwaste | | | | | | | | | | | | Not randomly selected | | |
| 271000 Offgas **(#62)** | | | | | | 4 | | | | | | Knowledge of the effect that a loss or malfunction of the following will have on the OFFGAS SYSTEM : (CFR: 41.7 / 45.7)<br>Dilution steam | 2.8 | 62 |
| 272000 Radiation Monitoring **(#63)** | | | | | | | | | 9 | | | Ability to monitor automatic operations of the RADIATION MONITORING SYSTEM including: (CFR: 41.7 / 45.7)<br>Containment isolation indications | 3.6 | 63 |
| 286000 Fire Protection | | | | | | | | | | | | Not randomly selected | | |
| 288000 Plant Ventilation | | | | | | | | | | | | Not randomly selected | | |
| 290001 Secondary CTMT | | | | | | | | | | | | Not randomly selected | | |
| 290003 Control Room HVAC **(#64)** | | | | 1 | | | | | | | | Knowledge of CONTROL ROOM HVAC design feature(s) and/or interlocks which provide for the following: (CFR: 41.7)<br>System initiations/reconfiguration: | 3.1 | 64 |
| 290002 Reactor Vessel Internals **(#65)** | | | | | 3 | | | | | | | Knowledge of the operational implications of the following concepts as they apply to REACTOR VESSEL INTERNALS : (CFR: 41.5 / 45.3)<br>Burnable poisons | 2.7 | 65 |
| K/A Category Totals: | 2 | 0 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 0 | Group Point Total: | | 12 |

Facility: **Fermi 2** Date of Exam: **09/13/04**

| Tier | Group | RO K/A Category Points | | | | | | | | | | | SRO-Only Points | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G * | Total | K | A | A 2 | G * | Total |
| 1. Emergency & Abnormal Plant Evolutions | 1 | N/A | N/A | N/A | | | | N/A | N/A | | | N/A | N/A | 1 | 0 | 6 | 1 | 8 |
| | 2 | N/A | N/A | N/A | | | | N/A | N/A | | | N/A | N/A | 0 | 0 | 4 | 0 | 4 |
| | Tier Totals | N/A | N/A | N/A | | | | N/A | N/A | | | N/A | N/A | 1 | 0 | 10 | 1 | 12 |
| 2. Plant Systems | 1 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 0 | 0 | 1 | 3 | 4 |
| | 2 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 1 | 0 | 0 | 1 | 2 |
| | Tier Totals | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 1 | 0 | 1 | 4 | 6 |
| 3. Generic Knowledge and Abilities Categories | | 1 | | | 2 | | | 3 | | | 4 | | N/A | 1 | 2 | 3 | 4 | 7 |
| | | N/A | | | N/A | | | N/A | | | N/A | | | 1 | 2 | 2 | 2 | |

Note:
1. Ensure that at least two topics from every K/A category are sampled within each tier of the RO Outline(i.e., the “Tier Totals” in each K/A category shall not be less than two). Refer to Section D.1.c for additional guidance regarding SRO sampling.
2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ±1 from that specified in the table based on NRC revisions. The final exam must total 75 points and the SRO-only exam must total 25 points.
3. Select topics from many systems and evolutions; avoid selecting more than two K/A topics from a given system or evolution unless they relate to plant-specific priorities.
4. Systems/evolutions within each group are identified on the associated outline.
5. The shaded areas are not applicable to the category/tier.
6.* The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system. The SRO K/As must also be linked to 10CFR 55.43 or an SRO-level Learning objective.
7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IR) for the applicable license level, and the point totals for each system and category. Enter the group and tier totals for each category in the table above; summarize all the SRO-only knowledge and non-A2 ability categories in the columns labeled “K” and “A.” Use duplicate pages for RO and SRO-only exams.
8. For Tier 3, enter the K/A numbers, descriptions, importance ratings, and point totals on Form ES-401-3.
9. Refer to ES-401, Attachment 2 for guidance regarding the elimination of inappropriate K/A statements.

| ES-401 | BWR Examination Outline<br>Emergency and Abnormal Plant Evolutions – Tier 1/Group 1 (**SRO**) | | | | | | | Form ES-401-1 | |
|---|---|---|---|---|---|---|---|---|---|
| E/APE # / Name / Safety Function | K 1 | K 2 | K 3 | A 1 | A 2 | G | K/A Topic | IR | # |
| 295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4 | | | | | | | Not randomly selected | | |
| 295003 Partial or Complete Loss of AC / 6 **(#1)** | | | | | 4 | | Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER : (CFR: 41.10 / 43.5 / 45.13)<br>System lineups | 3.7 | 1 |
| 295004 Partial or Total Loss of DC Pwr / 6 | | | | | | | Not randomly selected | | |
| 295005 Main Turbine Generator Trip / 3 | | | | | | | Not randomly selected | | |
| 295006 SCRAM / 1 | | | | | | | Not randomly selected | | |
| 295016 Control Room Abandonment / 7 | | | | | | | Not randomly selected | | |
| 295018 Partial or Total Loss of CCW / 8 **(#2)** | | | | | 4 | | Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER : (CFR: 41.10 / 43.5 / 45.13)<br>System flow | 2.9 | 2 |
| 295019 Partial or Total Loss of Inst. Air / 8 | | | | | | | Not randomly selected | | |
| 295021 Loss of Shutdown Cooling / 4 **(#3)** | | | | | 6 | | Ability to determine and/or interpret the following as they apply to LOSS OF SHUTDOWN COOLING : (CFR: 41.10 / 43.5 / 45.13)<br>Reactor pressure | 3.3 | 3 |
| 295023 Refueling Acc Cooling Mode / 8 | | | | | | | Not randomly selected | | |
| 295024 High Drywell Pressure / 5 **(#4)** | | | | | 1 | | Ability to determine and/or interpret the following as they apply to HIGH DRYWELL PRESSURE: (CFR: 41.10 / 43.5 / 45.13)<br>Drywell pressure | 4.4 | 4 |
| 295025 High Reactor Pressure / 3 **(#5)** | | | | | 2 | | Ability to determine and/or interpret the following as they apply to HIGH REACTOR PRESSURE: (CFR: 41.10 / 43.5 / 45.13)<br>Reactor power | 4.2 | 5 |
| 295026 Suppression Pool High Water Temp. / | | | | | | | Not randomly selected | | |
| 295028 High Drywell Temperature / 5 | | | | | | | Not randomly selected | | |
| 295030 Low Suppression Pool Wtr Lvl / 5 **(#6)** | | | | | 3 | | Ability to determine and/or interpret the following as they apply to LOW SUPPRESSION POOL WATER LEVEL : (CFR: 41.10 / 43.5 / 45.13)<br>Reactor pressure | 3.9 | 6 |
| 295031 Reactor Low Water Level / 2 | | | | | | | Not randomly selected | | |
| 295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1 **(#7)** | | | | | | * | 2.1.6 Ability to supervise and assume a management role during plant transients and upset conditions. (CFR: 43.5 / 45.12 / 45.13) | 4.3 | 7 |
| 295038 High Off-site Release Rate / 9 **(#8)** | | 5 | | | | | Knowledge of the interrelations between HIGH OFF-SITE RELEASE RATE and the following: (CFR: 41.7 / 45.8)<br>Site emergency plan | 4.7 | 8 |
| 600000 Plant Fire On Site / 8 | | | | | | | Not randomly selected | | |
| K/A Category Totals: | 0 | 1 | 0 | 0 | 6 | 1 | Group Point Total: | | 8 |

| ES-401 | BWR Examination Outline | | | | | | | Form ES-401-1 | |
|---|---|---|---|---|---|---|---|---|---|
| Emergency and Abnormal Plant Evolutions – Tier 1/Group 2 (**SRO**) | | | | | | | | | |
| E/APE # / Name / Safety Function | K 1 | K 2 | K 3 | A 1 | A 2 | G | K/A Topic | IR | # |
| 295002 Loss of Main Condenser Vac / 3 | | | | | | | Not randomly selected | | |
| 295007 High Reactor Pressure / 3 **(#9)** | | | | | 2 | | Ability to determine and/or interpret the following as they apply to HIGH REACTOR PRESSURE : (CFR: 41.10 / 43.5 / 45.13)<br>Reactor power | 4.1 | 9 |
| 295008 High Reactor Water Level / 2 | | | | | | | Not randomly selected | | |
| 295009 Low Reactor Water Level / 2 | | | | | | | Not randomly selected | | |
| 295010 High Drywell Pressure / 5 **(#10)** | | | | | 6 | | Ability to determine and/or interpret the following as they apply to HIGH DRYWELL PRESSURE : (CFR: 41.10 / 43.5 / 45.13)<br>Drywell temperature | 3.6 | 10 |
| 295011 High Containmnet Temperature / 5 | | | | | | | Not randomly selected | | |
| 295012 High Drywell Temperature / 5 | | | | | | | Not randomly selected | | |
| 295013 High Suppression Pool Temp. / 5 | | | | | | | Not randomly selected | | |
| 295014 Inadvertent Reactivity Addition / 1 | | | | | | | Not randomly selected | | |
| 295015 Incomplete SCRAM / 1 | | | | | | | Not randomly selected | | |
| 295017 High Off-site Release Rate / 9 | | | | | | | Not randomly selected | | |
| 295020 Inadvertent Cont. Isolation / 5 & 7 | | | | | | | Not randomly selected | | |
| 295022 Loss of CRD Pumps / 1 | | | | | | | Not randomly selected | | |
| 295029 High Suppression Pool Wtr Lvl / 5 **(#11)** | | | | | 1 | | Ability to determine and/or interpret the following as they apply to HIGH SUPPRESSION POOL WATER LEVEL : (CFR: 41.10 / 43.5 / 45.13)<br>Suppression pool water level | 3.9 | 11 |
| 295032 High Secondary Containment Area Temperature / 5 | | | | | | | Not randomly selected | | |
| 295033 High Secondary Containment Area Radiation Levels / 9 | | | | | | | Not randomly selected | | |
| 295034 Secondary Containment Ventilation High Radiation / 9 | | | | | | | Not randomly selected | | |
| 295035 Secondary Containment High Differential Pressure / 5 | | | | | | | Not randomly selected | | |
| 295036 Secondary Containment High Sump/Area Water Level / 5 | | | | | | | Not randomly selected | | |
| 500000 High CNTMT Hydrogen Conc. / 5 **(#12)** | | | | | 4 | | Ability to determine and / or interpret the following as they apply to HIGH PRIMARY CONTAINMENT HYDROGEN CONCENTRATIONS: (CFR: 41.10 / 43.5 / 45.13)<br>Combustible limits for wetwell | 3.3 | 12 |
| K/A Category Totals: | 0 | 0 | 0 | 0 | 4 | 0 | Group Point Total: | | 4 |

| ES-401 | BWR Examination Outline<br>Emergency and Abnormal Plant Evolutions – Tier 2/Group 1 (**SRO**) | | | | | | | | | | | Form ES-401-1 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E/APE # / Name / Safety Function | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G | K/A Topic | IR | # |
| 203000 RHR/LPCI: Injection Mode **(#13)** | | | | | | | | 4 | | | | Ability to (a) predict the impacts of the following on the RHR/LPCI: INJECTION MODE (PLANT SPECIFIC) ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6)<br>A.C. failures | 3.6 | 13 |
| 205000 Shutdown Cooling | | | | | | | | | | | | Not randomly selected | | |
| 206000 HPC | | | | | | | | | | | | Not randomly selected | | |
| | | | | | | | | | | | | Not randomly selected | | |
| 209001 LPCS **(#14)** | | | | | | | | | | | * | 2.1.12 Ability to apply technical specifications for a system. (CFR: 43.2 / 43.5 / 45.3) | 4.0 | 14 |
| 211000 SLC | | | | | | | | | | | | Not randomly selected | | |
| 212000 RPS | | | | | | | | | | | | Not randomly selected | | |
| 215003 IRM | | | | | | | | | | | | Not randomly selected | | |
| 215004 Source Range Monitor | | | | | | | | | | | | Not randomly selected | | |
| 215005 APRM / LPRM | | | | | | | | | | | | Not randomly selected | | |
| 217000 RCIC | | | | | | | | | | | | Not randomly selected | | |
| 218000 ADS **(#15)** | | | | | | | | | | | * | 2.4.7 Knowledge of event based EOP mitigation strategies. (CFR: 41.10 / 43.5 / 45.13) | 3.8 | 15 |
| 223002 PCIS/Nuclear Steam Supply Shutoff | | | | | | | | | | | | Not randomly selected | | |
| 239002 SRVs | | | | | | | | | | | | Not randomly selected | | |
| 259002 Reactor Water Level Control **(#16)** | | | | | | | | | | | * | 2.4.48 Ability to interpret control room indications to verify the status and operation of system / and understand how operator action s and directives affect plant and system conditions. (CFR: 43.5 / 45.12) | 3.8 | 16 |
| 261000 SGTS | | | | | | | | | | | | Not randomly selected | | |
| 262001 AC Electrical Distribution | | | | | | | | | | | | Not randomly selected | | |
| | | | | | | | | | | | | Not randomly selected | | |
| 262002 UPS (AC/DC) | | | | | | | | | | | | Not randomly selected | | |
| 263000 DC Electrical Distribution | | | | | | | | | | | | Not randomly selected | | |
| 264000 EDGs | | | | | | | | | | | | Not randomly selected | | |
| 300000 Instrument Air | | | | | | | | | | | | Not randomly selected | | |
| | | | | | | | | | | | | Not randomly selected | | |
| 400000 Component Cooling Water | | | | | | | | | | | | Not randomly selected | | |
| K/A Category Totals: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 3 | Group Point Total: | | 4 |

| ES-401 | BWR Examination Outline<br>Emergency and Abnormal Plant Evolutions – Tier 2/Group 2 (**SRO**) | | | | | | | | | | | Form ES-401-1 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E/APE # / Name / Safety Function | K 1 | K 2 | K 3 | K 4 | K 5 | K 6 | A 1 | A 2 | A 3 | A 4 | G | K/A Topic | IR | # |
| 201001 CRD Hydraulic | | | | | | | | | | | | Not randomly selected | | |
| 201002 RMCS | | | | | | | | | | | | Not randomly selected | | |
| 201003 Control Rod and Drive Mechanism | | | | | | | | | | | | Not randomly selected | | |
| 201006 RWM | | | | | | | | | | | | Not randomly selected | | |
| 202001 Recirculation | | | | | | | | | | | | Not randomly selected | | |
| 202002 Recirculation Flow Control | | | | | | | | | | | | Not randomly selected | | |
| 204000 RWCU | | | | | | | | | | | | Not randomly selected | | |
| 214000 RPIS | | | | | | | | | | | | Not randomly selected | | |
| 215001 Traversing In-core Probe | | | | | | | | | | | | Not randomly selected | | |
| 215002 RBM<br>**(#17)** | | | | | | | | | | | * | 2.2.25 Knowledge of bases in technical specifications for limiting conditions for operations and safety limits. | 3.7 | 17 |
| 216000 Nuclear Boiler Inst. | | | | | | | | | | | | Not randomly selected | | |
| 219000 RHR/LPCI: Torus/Pool Cooling Mode | | | | | | | | | | | | Not randomly selected | | |
| 223001 Primary CTMT and Aux. | | | | | | | | | | | | Not randomly selected | | |
| 226001 RHR/LPCI: CTMT Spray Mode | | | | | | | | | | | | Not randomly selected | | |
| 230000 RHR/LPCI: Torus/Pool Spray Mode | | | | | | | | | | | | Not randomly selected | | |
| 233000 Fuel Pool Cooling and Cleanup | | | | | | | | | | | | Not randomly selected | | |
| 234000 Fuel Handling Equipment<br>**(#18)** | | | | | 2 | | | | | | | Knowledge of the operational implications of the following concepts as they apply to FUEL HANDLING EQUIPMENT : (CFR: 41.5 / 45.3)<br>Fuel handling equipment interlocks | 3.7 | 18 |
| 239001 Main and Reheat Steam | | | | | | | | | | | | Not randomly selected | | |
| 239003 MSIV Leakage Control | | | | | | | | | | | | Not randomly selected | | |
| 241000 Reactor/Turbine Pressure Regulator | | | | | | | | | | | | Not randomly selected | | |
| 245000 Main Turbine Gen. and Auxiliaries | | | | | | | | | | | | Not randomly selected | | |
| 256000 Reactor Condensate | | | | | | | | | | | | Not randomly selected | | |
| 259001 Reactor Feedwater | | | | | | | | | | | | Not randomly selected | | |
| 268000 Radwaste | | | | | | | | | | | | Not randomly selected | | |
| 271000 Offgas | | | | | | | | | | | | Not randomly selected | | |
| 272000 Radiation Monitoring | | | | | | | | | | | | Not randomly selected | | |
| 286000 Fire Protection | | | | | | | | | | | | Not randomly selected | | |
| 288000 Plant Ventilation | | | | | | | | | | | | Not randomly selected | | |
| 290001 Secondary CTMT | | | | | | | | | | | | Not randomly selected | | |
| 290003 Control Room HVAC | | | | | | | | | | | | Not randomly selected | | |
| 290002 Reactor Vessel Internals | | | | | | | | | | | | Not randomly selected | | |
| K/A Category Totals: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | Group Point Total: | | 2 |

| ES-401 | Generic Knowledge and Abilities Outline ( Tier 3) | | | | Form ES-401-3 | |
|---|---|---|---|---|---|---|
| Facility: **Fermi 2** | Date of Exam: **09/13/04** | | | | | |
| Category | K/A# | Topic | RO | | SRO-Only | |
| | | | IR | # | IR | # |
| 1. Conduct of Operations | 2.1.1 | Knowledge of conduct of operations requirements. (CFR: 41.10 / 45.13) | 3.7 | 66 | | |
| | 2.1.7 | Ability to evaluate plant performance and make operational judgments based on operating characteristics / reactor behavior / and instrument interpretation. (CFR: 43.5 / 45.12 / 45.13) | 3.7 | 67 | 4.4 | 19 |
| | 2.1.27 | Knowledge of system purpose and or function. (CFR: 41.7) | 2.8 | 68 | | |
| | Subtotal | | | **3** | | **1** |
| 2. Equipment Control | 2.2.22 | Knowledge of limiting conditions for operations and safety limits. (CFR: 43.2 / 45.2) | | | 4.1 | 20 |
| | 2.2.13 | Knowledge of tagging and clearance procedures. (CFR: 41.10 / 45.13) | 3.6 | 69 | | |
| | 2.2.29 | Knowledge of SRO fuel handling responsibilities. (CFR: 43.6 / 45.12) | | | 3.8 | 21 |
| | 2.2.30 | Knowledge of RO duties in the control room during fuel handling such as alarms from fuel handling area / communication with fuel storage facility / systems operated from the control room in support of fueling operations / and supporting instrumentation. (CFR: 45.12) | 3.5 | 70 | | |
| | Subtotal | | | **2** | | **2** |
| 3. Radiation Control | 2.3.2 | Knowledge of facility ALARA program. (CFR: 41.12 / 43.4 / 45.9 / 45.10) | 2.5 | 71 | | |
| | 2.3.4 | Knowledge of radiation exposure limits and contamination control / including permissible levels in excess of those authorized. (CFR: 43.4 / 45.10) | 2.5 | 72 | | |
| | 2.3.8 | Knowledge of the process for performing a planned gaseous radioactive release. (CFR: 43.4 / 45.10) | | | 3.2 | 22 |
| | 2.3.10 | Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure. (CFR: 43.4 / 45.10) | | | 3.3 | 23 |
| | Subtotal | | | **2** | | **2** |
| 4. Emergency Procedures / Plan | 2.4.9 | Knowledge of low power / shutdown implications in accident (e.g. LOCA or loss of RHR) mitigation strategies. (CFR: 41.10 / 43.5 / 45.13) | | | 3.9 | 24 |
| | 2.4.15 | Knowledge of communications procedures associated with EOP implementation. (CFR: 41.10 / 45.13) | 3.0 | 73 | | |
| | 2.4.21 | Knowledge of the parameters and logic used to assess the status of safety functions including: 1. Reactivity control 2. Core cooling and heat removal 3. Reactor coolant system integrity 4. Containment conditions 5. Radioactivity release control. (CFR: 43.5 / 45.12) | | | 4.3 | 25 |
| | 2.4.25 | Knowledge of fire protection procedures. (CFR: 41.10 / 45.13) | 2.9 | 74 | | |
| | 2.4.49 | Ability to perform without reference to procedures those actions that require immediate operation of system components and controls. (CFR: 41.10 / 43.2 / 45.6) | 4.0 | 75 | | |
| | Subtotal | | | **3** | | **2** |
| Tier 3 Point Total | | | | **10** | | **7** |